CLAIMS

We claim:

1. A cardioplegia solution comprising water with the following chemicals dissolved therein in the following concentrations:

Pyruvate (mM)	0.2 -50
NaCl (mM)	0-250
KCl (mM)	0-250
Glucose (mM)	0-200
Insulin (U/l)	0-200
$CaCl_2$ (mM)	0-20
Lidocaine (g/l)	0-2.

2. The solution of claim 1, in which pyruvate is provided in the chemical form of a free acid, as a salt in which the metal cation is sodium, calcium, or potassium, or as a salt in which the cation is an organic compound.

3. The solution of claim 1, additionally comprising amino acids.

4. The solution of claim 1, additionally comprising vitamins.

5. The solution of claim 1, additionally comprising a pharmacological agent.

6. The solution of claim 5, wherein the pharmacological agent is selected from the group consisting of β-adrenergic receptor antagonists, Ca^{2+} channel antagonists, and antioxidants.

7. A process for performing cardiopulmonary bypass surgery in a human comprising the following steps:

i) preparing a patient to allow surgical access to the heart;

ii) inducing arrest of the heart through application of a cardioplegia comprising the following chemicals dissolved therein in the following concentrations:

Pyruvate (mM)	0.2 – 50
NaCl (mM)	0-250
KCl (mM)	0-250
Glucose (mM)	0-200
Insulin (U/l)	0-200
$CaCl_2$ (mM)	0-20
Lidocaine (g/l)	0-2

iii) providing a bypass mechanism to a partially or wholly obstructed artery;

iv) ceasing administration of the cardioplegia solution;

v) providing a chemical or mechanical stimulus to induce the heart to resume beating;

vi) completing the surgical procedure.

8. The process of claim 7, wherein the cardioplegia solution is diluted with whole blood prior to administration to the patient.

9. The process of claim 8, wherein the ratio of blood volume to cardioplegia solution volume is between 0.1:1 and 20:1.

10. The process of claim 8, wherein the ratio of blood volume to cardioplegia solution volume is between 1:1 and 10:1.

11. The process of claim 8, wherein the ratio of blood volume to cardioplegia solution volume is between 2:1 and 8:1.

12. The process of claim 7, wherein the cardioplegia solution protects the heart from injury resulting from ischemia.

13. The process of claim 7, wherein the heart exhibits rapid and robust recovery of mechanical function following the provision of a mechanical or chemical stimulus to resume beating.

14. The process of claim 7, wherein the cardioplegia solution stabilizes the heart's energy reserves during the cardiopulmonary bypass surgery.

15. The process of claim 7, wherein metabolism of the cardioplegia solution by the heart produces compounds which neutralize prooxidant compounds during and immediately after the period of arrest.

16. The process of claim 7, wherein metabolism of the cardioplegia solution by the heart maintains the heart's antioxidant components during cardiopulmonary bypass surgery.

17. The process of claim 7, wherein pharmacological inotropic support is not administered following completion of the surgical procedure.

18. A method of preparing a cardioplegia solution comprising the steps of:

i) obtaining medical-grade electrolyte reagents and preparing in water a solution of the following reagents dissolved therein in the following concentrations:

Pyruvate (mM)	0.2 – 50
NaCl (mM)	0-250
KCl (mM)	0-250
Glucose (mM)	0-200
Insulin (U/l)	0-200
$CaCl_2$ (mM)	0-20
Lidocaine (g/l)	0-2;

ii) filtering the solution through a filter with a pore size between of between 0.05 and 1 µm.